



Bolo Tine Kit
OEM-290-253 / 290-253-081
for HORSE™, ECONO HORSE™, and PONY® Tillers

Installation Instructions

THANK YOU!

Thanks for buying new bolo tines. These tines were designed for your model tiller and will handle all of your tilling needs including sod busting, seedbed preparation, cultivating, and turning under crop residue.

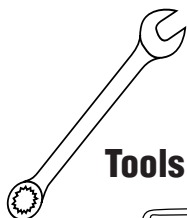


How To Use These Instructions

These instructions apply only to owners of the following tillers:

- HORSE™ Model
- ECONO HORSE™ Model
- PONY® Model

First, read the general information given for all model tillers on Pages 1 through 4. You will then be directed to installation instructions for your particular model tiller. Carefully look at the adjacent figures while following the step-by-step instructions. Finally, see the Bolo Tines Maintenance Section on Page 16.



Tools Needed

- Wrenches (two 9/16 inch)
- Screwdriver (medium-sized)
- Soft Rubber Mallet
- Penetrating Oil
- Metal File (needed only if tine holders are also removed)



How To Reach Us

If you have any questions about removing or installing tines, please refer to the "Customer Assistance" information on the back cover.

Attention! **HORSE Model Owners**

Horse Model tillers have two different style tine holders as shown in figures to the right:

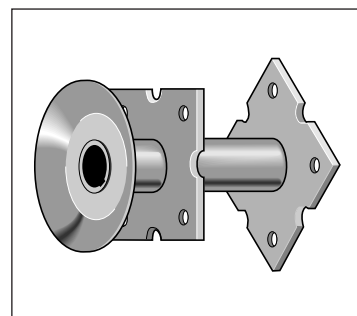
- Welded steel

Note: Welded steel holders may be secured to tine shaft either with two bolts and nuts or with single mounting bolt (illustrated in these instructions).

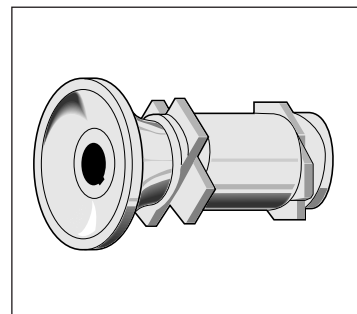
- Cast iron

Owners of HORSE Model tillers with **cast iron** tine holders should **keep the cardboard box** in which this kit was shipped to use with the template (pattern) on the inside back cover of these instructions. You will use both the template and the box when assembling tines.

Owners of all other models can ignore the template and discard the box.



Welded Steel Tine Holder



Cast Iron Tine Holder

PRE-INSTALLATION STEPS

Step 1: Check Your Parts

Remove the tines and hardware package and check that you received all of the parts listed below for your model tiller. If any parts are missing or damaged, contact our Technical Service Department and we will arrange for replacements.

Item	Qty	Part #	Description
Horse, Econo Horse, and Pony Standard Tines	8	GW-1270-1	Left-curved Tines
	8	GW-1270-2	Right-curved Tines
Hardware for Standard Tines (All Models)	16	1100043	3/8"-16 x 1-1/4" Hex Head Bolts (Grade 5)
	16	1733398	3/8"-16 Hex Locknuts
Custom Tines (All Models)	8	GW-2475-1	Left-curved Custom Tines
	8	GW-2475-2	Right-curved Custom Tines
	16	710-0514	3/8"-16 x 1-1/4" Hex Head Bolts (Grade 5)
	16	712-0798	3/8"-16 Hex Nuts
	16	736-0169	3/8" Lock Washers



WARNING

To prevent serious personal injury when removing or installing your bolo tines:

- Stop the engine, and remove the electric start key (if your tiller features electric start).
- Let the engine and muffler area cool.
- Disconnect the spark plug wire, and position the wire away from the plug to prevent accidental starting.



CAUTION

Tine edges can be sharp and can have slivers that could cause personal injury. Use care at all times when handling tines. The tine hood edges may also be sharp. To prevent personal injury, wear thick gloves when touching the edges of the hood.

Step 2: Tine Removal

A. Carefully tilt the tiller forward until the engine is resting on the ground. (On some models it may be necessary to prop up the rear of the tiller or to add additional weight to the engine to stabilize the tiller in this position.)

B. Raise the tiller hood flap and secure it out of the way with a rubber band, string or, in the case of the PONY tiller, with the depth regulator adjustment bar knob.

C. Use two 9/16-inch wrenches to remove the bolts which attach the tines to the holders. (**Tines are not attached to cast iron holders with bolts. In the case of cast iron holders, remove each gang [set of four tines] from a holder by removing only one bolt, and then loosening the other three bolts on the same gang.**)

D. Always discard old hardware and tines. Use only the hardware which came with your new tines.

If You Ordered Custom Tines...

Custom tines (special, hard-faced tines which last up to 2-1/2 times longer than standard tines) are perfect for tilling sandy, gritty soil, or for custom tilling or market gardening.

If you received Custom tines, read this General Information and then follow the standard tine installation instructions which apply to your particular model tiller.

If you have any difficulty installing your Custom tines, contact our Service Department (Refer to the back cover of this manual.)

Bolt Removal Tips

- Loosen** all four nuts on a holder plate or tine gang before trying to **remove** any of the nuts and bolts.
- If necessary, use penetrating oil to loosen stubborn nuts.
- If necessary, place the closed (boxed) end of a wrench on the **nut** and sharply tap the wrench with the rubber mallet until the nut is loose.

Step 3: Tine Identification

Separate the sixteen new tines into two groups: **eight left-curved tines** and **eight right-curved tines**. Tines can be identified as either left-curved or right-curved tines in two ways:

A. The letters and numbers stamped on the side of each tine are factory code marks which contain either an "L" (on left-curved tines) or an "R" (on right-curved tines). See Figure 1.

B. Or, hold the tine with the **blunt** edge toward you. If the **tip** curves toward the left, the tine is a left-curved tine. If the **tip** curves toward the right, the tine is a right-curved tine. See Figures 2 and 3 which show the two types of tines.

Step 4: Bolt Installation

NOTE: Skip this step if you have a HORSE Model tiller with cast iron tine holders.

A. On all other models, place the sixteen bolts through the holes in the tine holders with the threaded ends of the bolts pointing outward toward each side of the tiller as shown below in Figure 4. (**The installation of tines on holders is described later in these instructions.**)

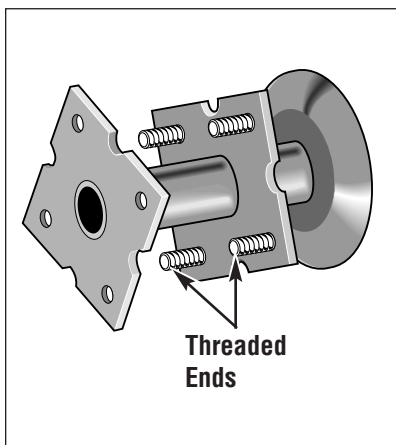


Figure 4: Insertion of bolts.

B. Sort lock washers and nuts into four groups of four each.

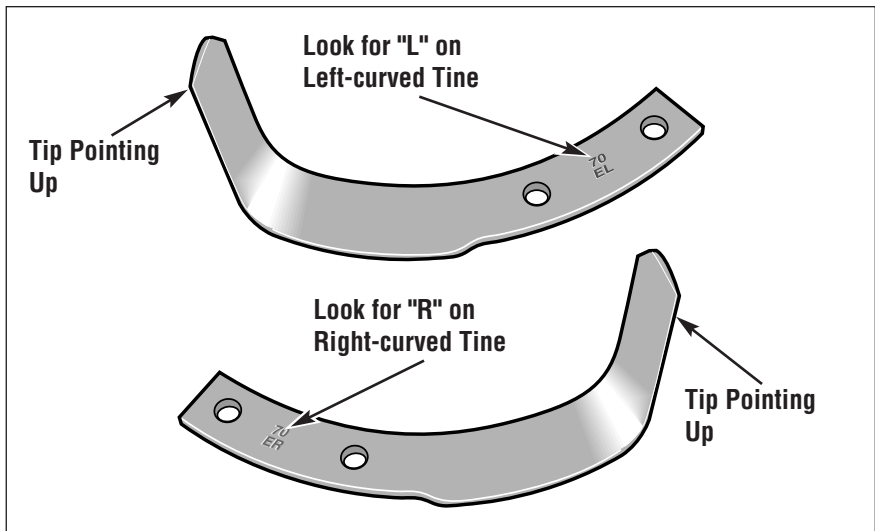


Figure 1: Look for "L" or "R" stamped on the tines.

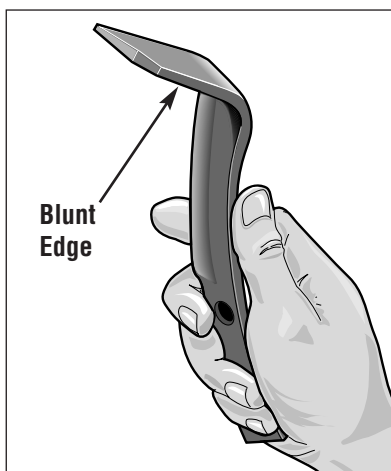


Figure 2: Left-curved tine.

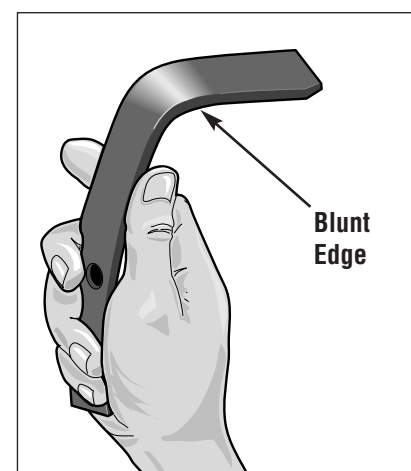


Figure 3: Right-curved tine.

IMPORTANT: Tines rotate in the same direction as the wheels. During the installation steps, place tines on holders so cutting edges (not the blunt, wider edges) will enter the soil first when the tiller moves forward. See Figure 5.

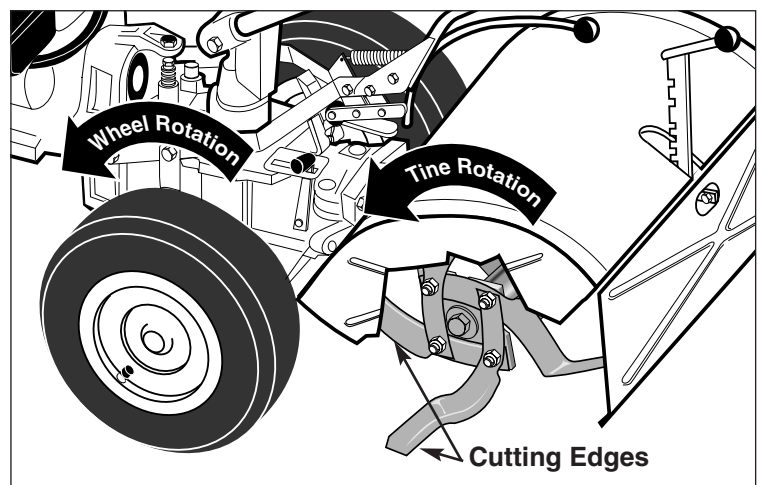


Figure 5: Cutting edges of tines must enter the soil first when the tiller moves forward.

Step 5: Find the Installation Instructions for Your Model

Each tiller's distinctive tine pattern provides the optimum in tilling performance for that model. Be sure to install tines in the pattern described for your tiller. *Find your tiller in the following list and go to the indicated page to continue with tine installation.*

- HORSE (Welded Steel Tine Holders), see the instructions at the bottom of this page.
- HORSE (Cast Iron Tine Holders), see **Page 8**.
- PONY, see **Page 12**.
- ECONO HORSE, see **Page 14**.

Order of Installation

On all models, tines will be installed in the following order (see Figure 6):

- A** Left Inner Holder
- B** Right Inner Holder
- C** Left Outer Holder
- D** Right Outer Holder

NOTE: When installing the tines you will be directed to perform a two step procedure and then check to ensure that the installation is correct before going on to the next step.

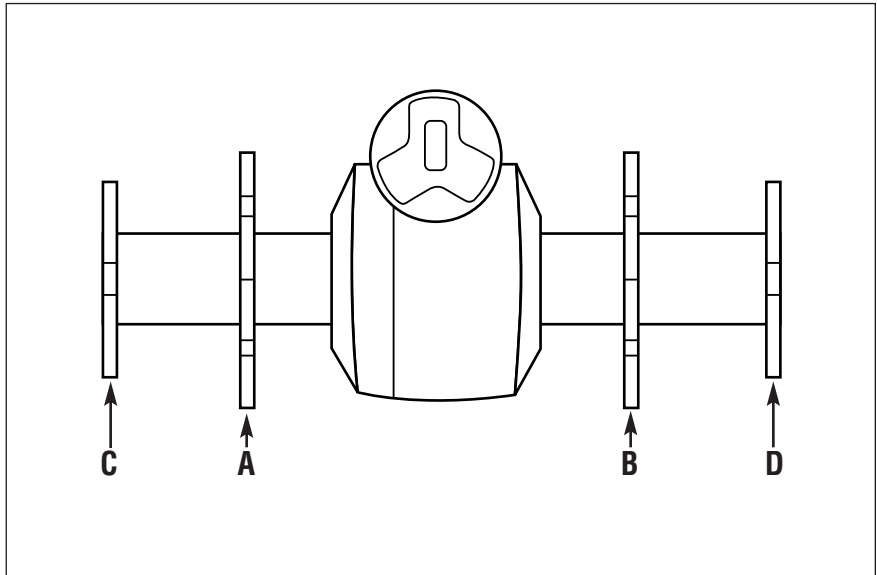


Figure 6: Order of installation on holders (welded steel holders shown).

HORSE MODEL TINE INSTALLATION (WELDED STEEL HOLDERS)

Use this procedure to install tines only if your tine holders are shaped as shown below in Figure 7.

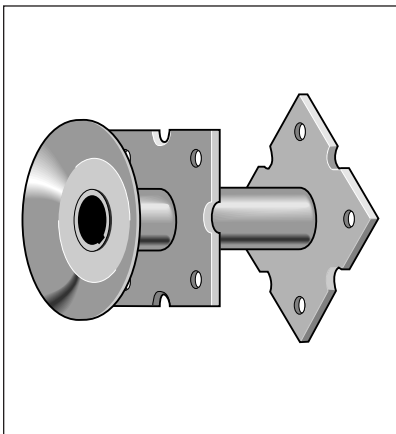


Figure 7: Welded steel tine holder.

NOTE: Be sure to use the specific tines (left or right curved) called for in each installation step.



Step 1: Position Holders Before Starting Tine Installation

On PTO Models, disengage the PTO Lever. On non-PTO Models, place the Forward/Reverse Lever in Neutral.

Rotate the tine holders and shaft (by hand) until any one of the semi-circles on the *outer* mounting plates of the holders is at the 12 o'clock position in relation to the ground. See Figure 8 on Page 5.

Step 2: Install Tines on Left Inner Holder

Tines used in this step:

-  two **right-curved** tines followed by
-  two **left-curved** tines

A. Place two *right-curved* tines (shown shaded in Figure 8) *opposite* each other on the previously installed bolts. Make sure that the tines are positioned as follows:

- ✓ Tines are *across from* each other.
- ✓ Tines are against the *outer* surface of the left inner holder plate.

- ✓ Tips point *inward* toward the transmission housing.
- ✓ The *cutting edges* will enter the soil first when the tiller moves forward.

B. Place two *left-curved* tines (unshaded in Figure 8) *opposite* each other on the bolts, overlapping the tines installed in Step 2-A. Make sure that the tines are positioned as follows:

- ✓ These tines are also *across from* each other.
- ✓ Tips point *outward* toward the sides of the tiller.
- ✓ The *cutting edges* will enter the soil first when the tiller moves forward.

C. Add lock washers and nuts to all four bolts and tighten securely.

Step 3: Install Tines on Right Inner Holder

Tines used in this step:



two **left-curved** tines

followed by



two **right-curved** tines

A. Place two *left-curved* tines (shown shaded in Figure 8) *opposite* each other on the previously installed bolts. Make sure that the tines are positioned as follows:

- ✓ The tips of these two tines should be directly opposite the tips of the two right-curved tines installed on the left inner holder in Step 2-A (see Figure 8).

- ✓ Tines are against the *outer* surface of the right inner holder plate.
- ✓ Tips point *inward* toward the transmission housing.
- ✓ The *cutting edges* will enter the soil first when the tiller moves forward.

B. Place two *right-curved* tines (unshaded in Figure 8) *opposite* each other on the bolts, overlapping the tines installed in Step 3-A. Make sure that the tines are positioned as follows:

- ✓ These tines are also *across from* each other.
- ✓ Tips point *outward* toward the sides of the tiller.
- ✓ The *cutting edges* will enter the soil first when the tiller moves forward.

C. Add lock washers and nuts to all four bolts and tighten securely.

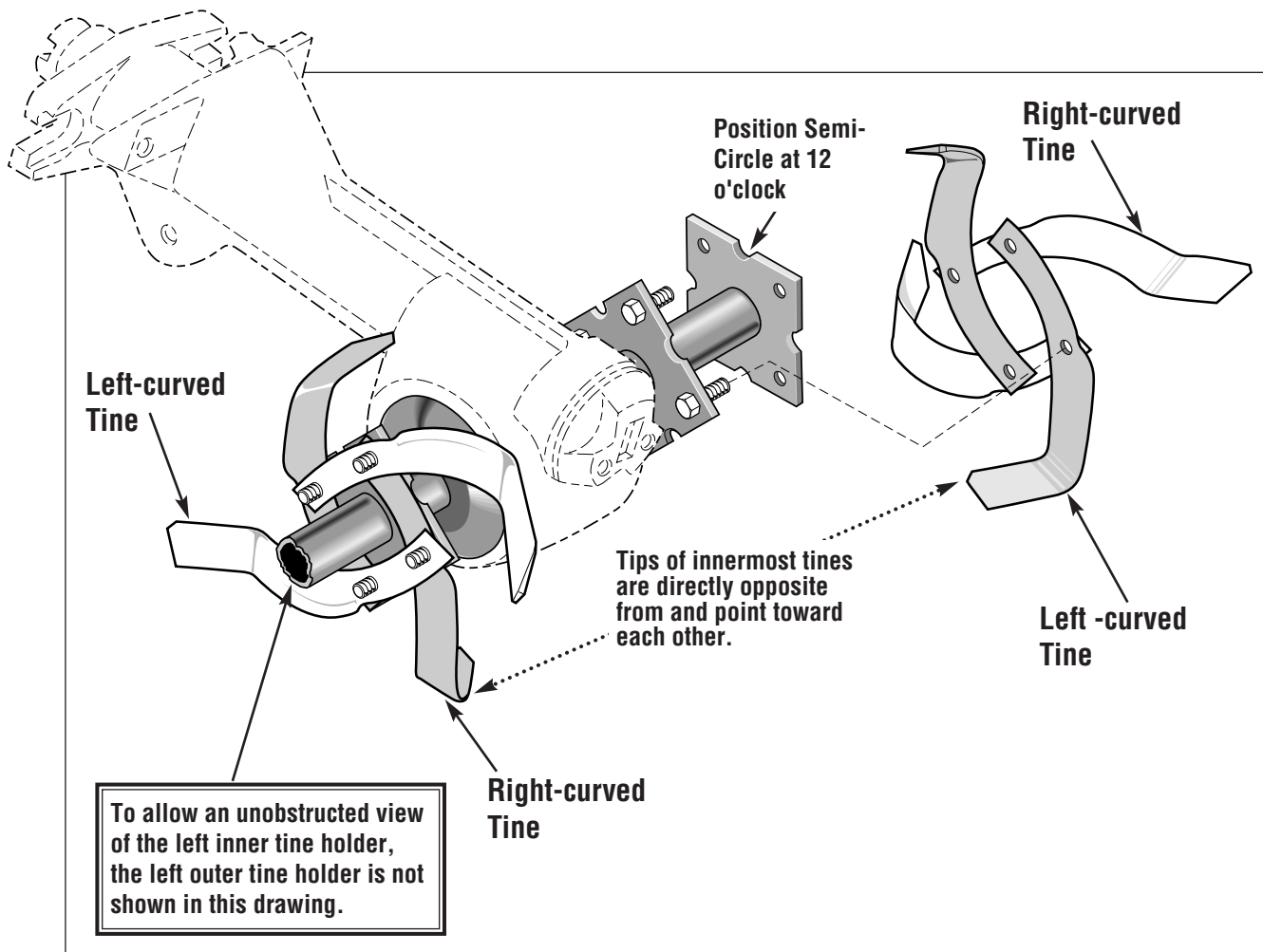


Figure 8: Installing tines on inner holders.

Step 4: Check the Installation

This completes the installation of the tines on the two inner holders. To ensure that the installation is correct, check for the following:

A. Make sure that the tips of the four *innermost* tines (those nearest the transmission housing) are directly opposite each other, pointing toward each other and toward the transmission housing. See Figure 9.

B. Make sure that the cutting edges of all tines will enter the soil first when the tiller moves forward.

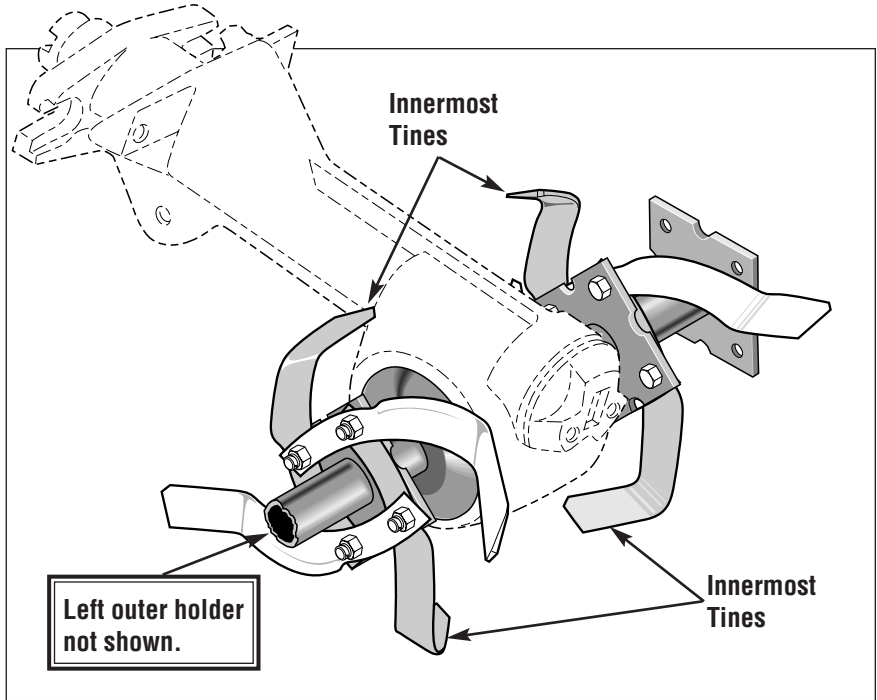


Figure 9: Innermost tines on inner holders.

Step 5: Install Tines on Left Outer Holder

Tines used in this step:



Two **right-curved** tines followed two **left-curved** tines

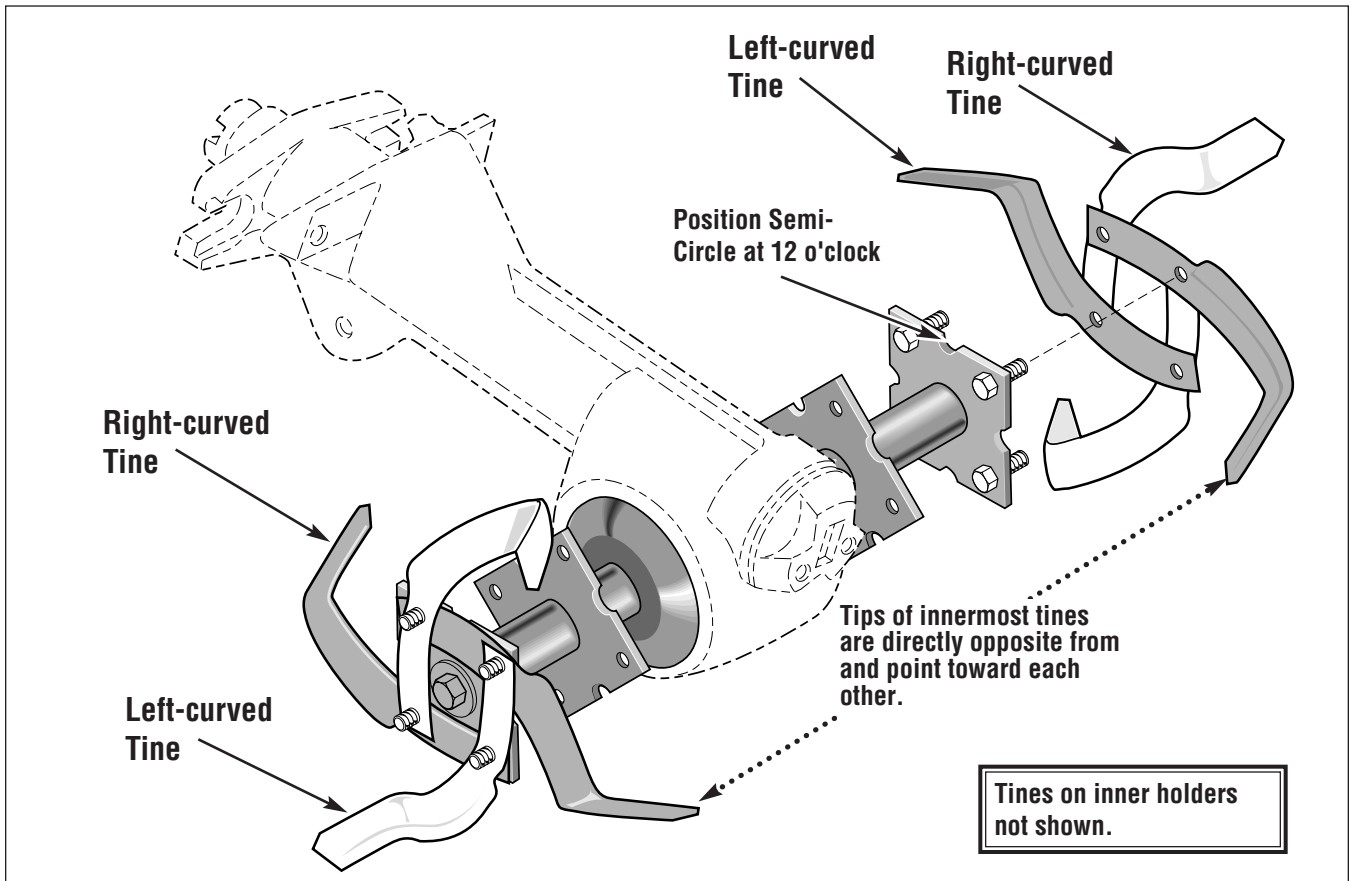


Figure 10: Installing tines on outer holders.

A. Place two **right-curved** tines (shown shaded in Figure 10) **opposite** each other on the previously installed bolts. Make sure that the tines are positioned as follows:

- ✓ Tines are **across from** each other.
- ✓ Tines are against the **outer** surface of the left holder outer plate.

- ✓ Tips point **inward** toward the transmission housing.
- ✓ The **cutting edges** will enter the soil first when the tiller moves forward.

B. Place two **left-curved** tines (unshaded in Figure 10) **opposite** each other on the bolts, overlapping the tines installed in Step 5-A. Make sure that the tines are positioned as follows:

- ✓ Tines are **across from** each other.
- ✓ Tips point **outward** toward the sides of the tiller.
- ✓ The **cutting edges** will enter the soil first when the tiller moves forward.

C. Add lock washers and nuts to all four bolts and tighten securely

Step 6: Install Tines on Right Outer Holder

Tines used in this step:



two **left-curved** tines

followed by



two **right-curved** tines

A. Place two **left-curved** tines (shown shaded in Figure 10) **opposite** each other on the previously installed bolts. Make sure that the tines are positioned as follows:

- ✓ The tips of these tines are directly opposite the tips of the two tines installed in Step 5-A.
- ✓ Tines are against the **outer** surface of the right holder outer plate.
- ✓ Tips point **inward** toward the transmission housing.
- ✓ The **cutting edges** will enter the soil first when the tiller moves forward.

B. Place two **right-curved** tines (shown unshaded in Figure 10) **opposite** each other on the bolts, overlapping the tines positioned in Step 6-A. Make sure that the tines are positioned as follows:

- ✓ Tines are **across from** each other.
- ✓ Tips point **outward** toward the sides of the tiller.
- ✓ The **cutting edges** will enter the soil when the tiller moves forward.

C. Add lock washers and nuts to all four bolts and tighten securely

Step 7: Check the Installation

This completes the installation of the tines on the two **outer** holders. To ensure that the installation is correct, check for the following:

A. Make sure that the tips of the four **innermost** tines on the **outer** holder (those nearest the transmission) are directly **opposite** each other and pointing inward, toward each other. See Figure 11.

B. Make sure that the **cutting edges** of all tines will enter the soil first when the tiller is moving forward.

This completes the installation steps for HORSE Models with welded steel tine holders. Also read and follow the instructions given in the Bolo Tines Maintenance Section on Page 16.

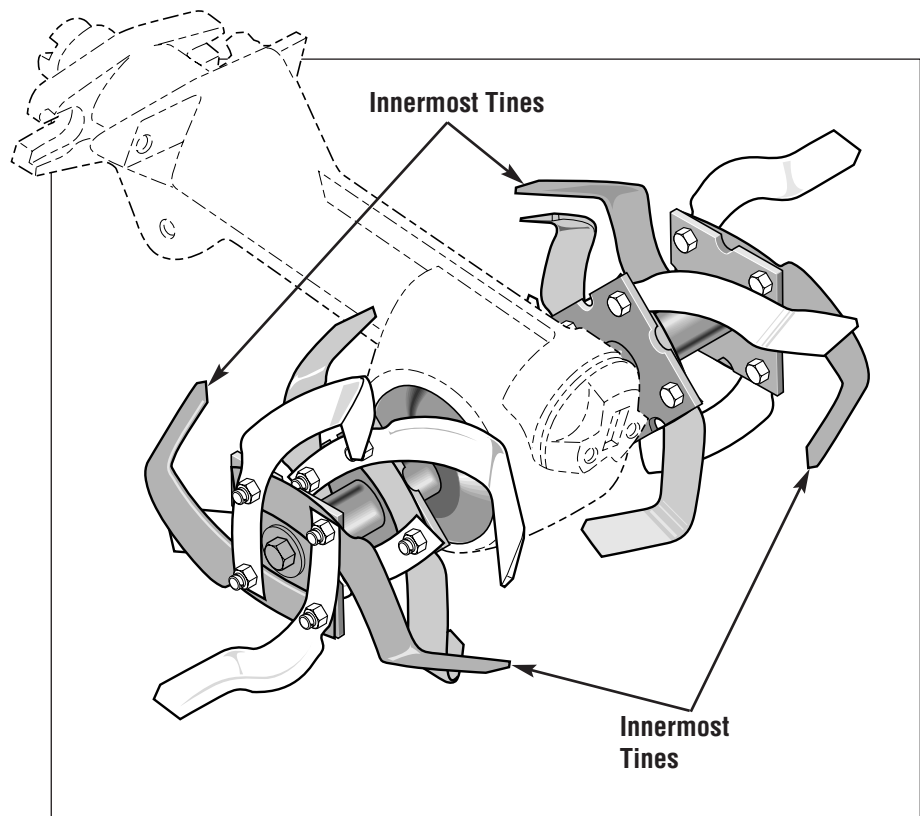


Figure 11: Outermost tines on outer holders.

HORSE MODEL TINE ASSEMBLY AND INSTALLATION (CAST IRON HOLDERS)

Use these instructions only if your tiller is equipped with tine holders shaped as shown below in Figure 12.

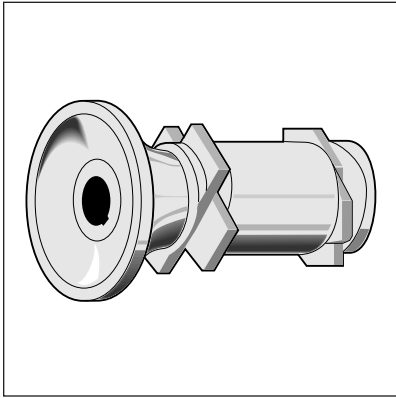


Figure 12: Cast iron tine holder.

Step 1: Assemble Tines Into Gangs

Before starting this procedure, tape the tine pattern template (from the inside back cover), onto the bottom of the shipping box as shown in Figure 13. Position the box with the taped template in front of you.

In this assembly procedure, you will be assembling left-curved and right-curved tines into **gangs** (sets of four tines assembled according to a specific pattern). When the assembly is complete, you will have three (3) "A" gangs and one (1) "B" gang (see Figure 14).

All "A" gangs have an identical tine pattern. The "B" gang has a slightly different pattern.

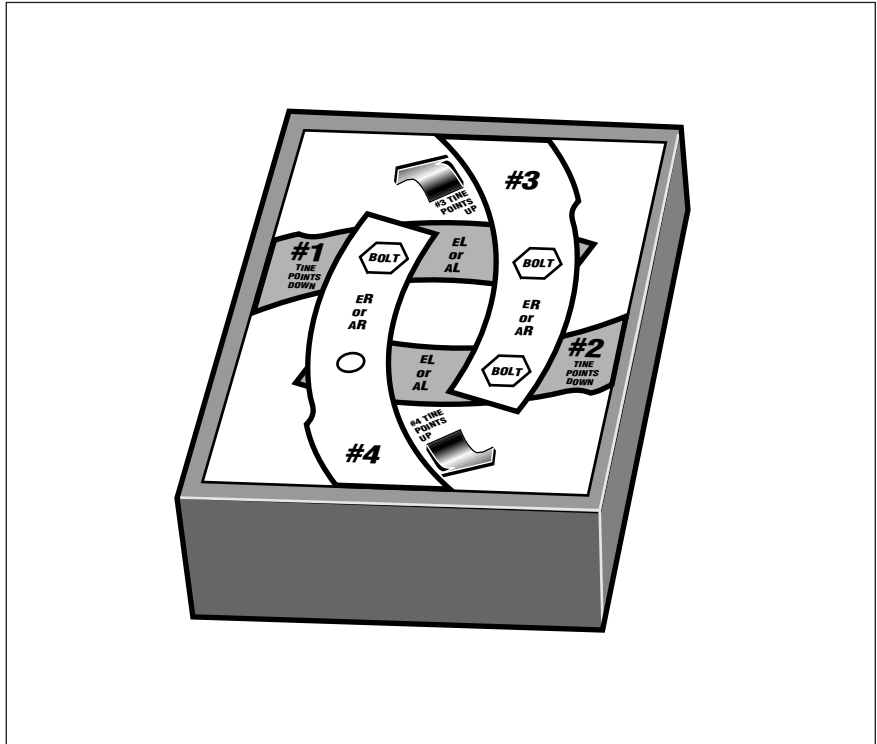


Figure 13: Template taped on box.

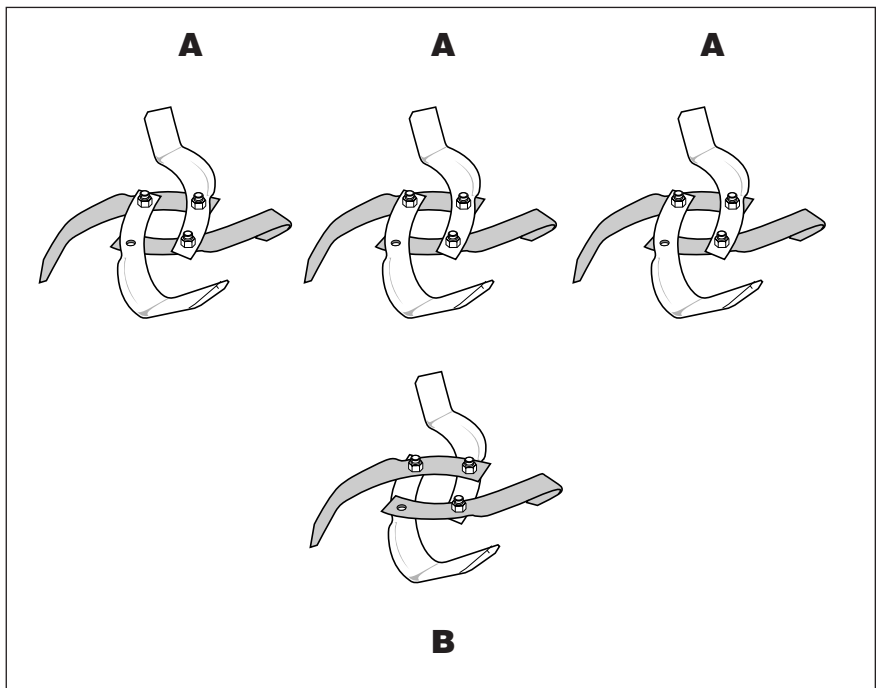


Figure 14: Three "A" gangs and one "B" gang.

Step 2: Assemble Three "A" Gangs

Tines used in this step:



two **left-curved** tines

followed by



two **right-curved** tines

A. Place two *left-curved* tines onto the template so that the tines cover the outlines of tines #1 and #2 as shown in Figure 15. The tips of the tines point

downward (overhanging the sides of the box).

B. Place three bolts through the holes as shown in Figure 16.

C. Place two *right-curved* tines (shown in Figure 16) onto the bolts so that the tines cover the outlines of tines #3 and #4. These tines are **opposite** each other on top of the tines already in place. The tips of these tines face *upward* as shown.

NOTE: Do *not* insert a bolt through the fourth hole.

D. Add lockwashers (not used with Custom tines) and nuts to the three bolts and *barely tighten* the nuts (just so they do not fall off the bolts).

E. For future identification when installing the gangs on the holders, use chalk or crayon to mark each gang with an "A."

F. Repeat Steps A through E to construct *two more* "A" gangs. Set these gangs aside until you install them in Step 4 on Page 10.

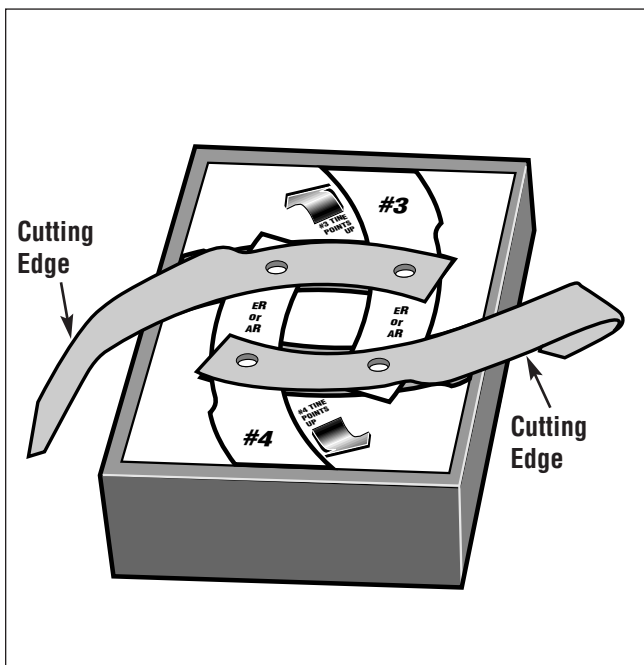


Figure 15: Assembly of an "A" gang.

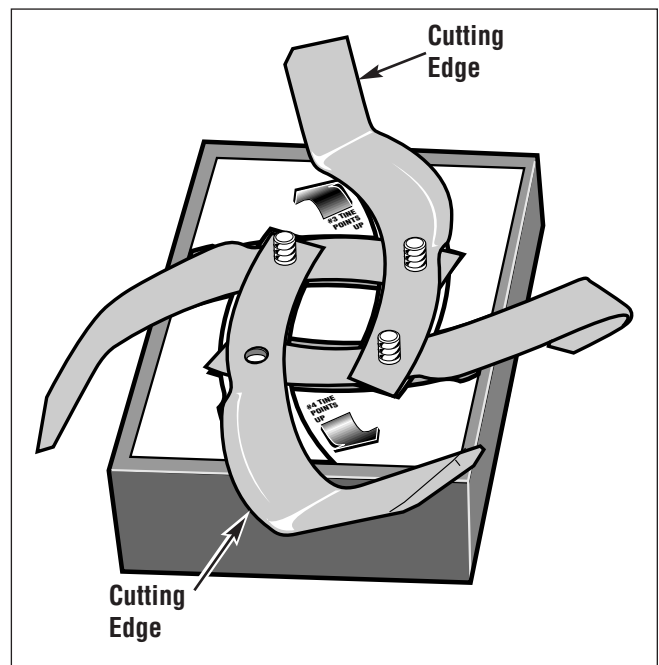


Figure 16: Insert bolts.

Step 3. Assemble One "B" Gang

Tines used in this step:



two **right-curved** tines

followed by



two **left-curved** tines

A. Position the box (with the attached template) in front of you as was done when assembling the "A" gangs.

B. Place two *right-curved* tines (shown in Figure 17 on Page 10) onto the template so that the tines cover outlines of tines #3 and #4. The tips of these tines point *upward*.

C. Place three bolts through the holes shown in Figure 18 on Page 10.

D. Place two *left-curved* tines (shown in Figure 18) onto the bolts so that the tines cover the outlines of tines #1 and #2. These tines are **opposite** each other on top of the tines already in place. The tips of these tines point *downward* (overhanging the sides of the box).

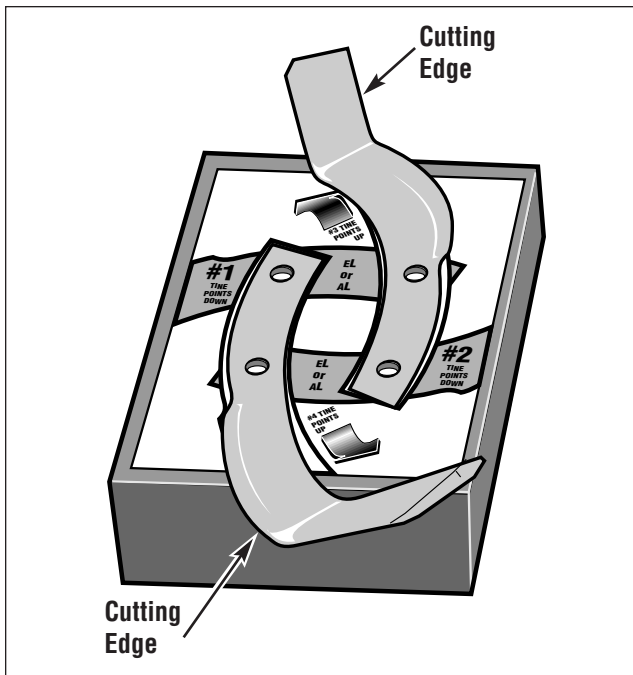


Figure 17: Assembly of a "B" gang.

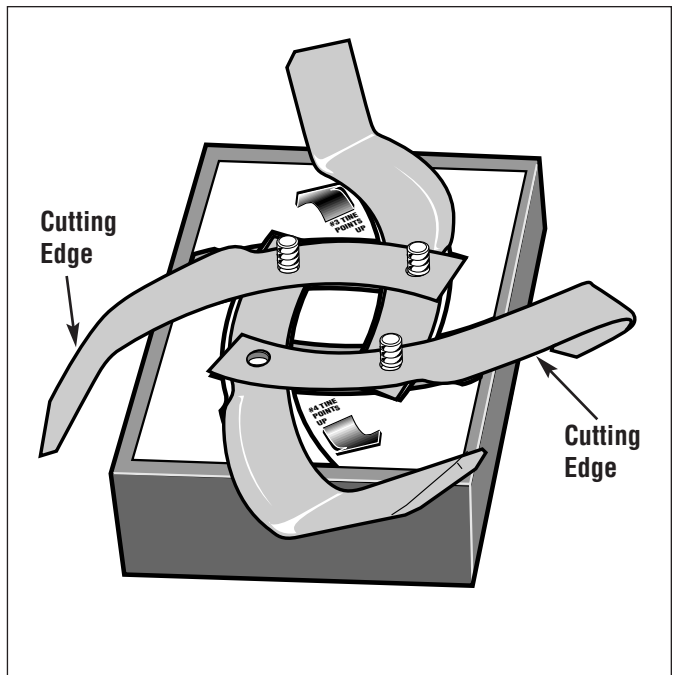


Figure 18: Add lockwashers and nuts to "B" gang.

NOTE: Do *not* insert a bolt through the fourth hole.

E. Add locknuts to the three bolts and *barely tighten* the nuts (just so they do not fall off the bolts).

F. For future identification when installing this gang on the holder, use chalk or crayon to mark the gang with a "B."

Step 4: Install Gangs on Holders

In the gangs just assembled, all cutting edges are facing in one direction. When installed on the holders, these cutting edges *must enter* the soil first when the tiller is *moving forward*. Figure 19 shows the correct position on the tine holders for the three "A" gangs and the "B" gang.

Note that each holder shows a letter which corresponds to the "A" and "B" markings on the tine gangs just assembled, and a number which represents the order in which the tine gangs are installed on the holders.

A. Make sure that the tine bolts are loose. Take one "A" gang and wrap it around the tine holder at position #1. Check that the cutting edges are positioned so that they will enter the soil first when the tiller moves forward.

B. Rotate the gang so that the the two *innermost* tines are around one lug on the tine holder and the other two tines are around the other lug.

C. Insert a new bolt (of the four set aside for this set) through the remaining set of holes in the tines. (See "Installation Tips" on Page 11.) Add lockwashers (not used with Custom tines) and nuts. Tighten all four bolts securely.

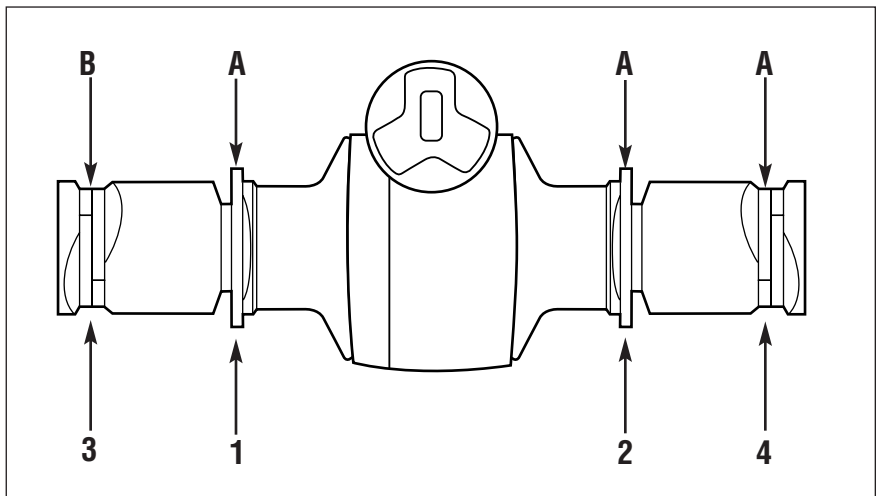


Figure 19: Position of tine gangs on cast iron holders as viewed from rear of tiller.

D. Follow the procedure described in Steps A through C to install the other two "A" gangs at positions #2 and #4.

E. Install the "B" gang on the left outer holder at position #3 as shown in Figure 20, after following Steps A through C above.

Installation Tips

If you encounter difficulty in aligning the two holes when inserting the fourth bolt, check the following:

- Make sure that the bolts in the other three sets of holes are as loose as possible.
- Use a screwdriver inserted through the two empty holes to pry the tines together.
- Use a mallet to lightly tap the tines into the proper position.
- If the holes still cannot be aligned, remove the tine gangs from the holder, remove the holder from the tine shaft and examine the holder for rough spots in the groove between the lugs. Smooth any rough spots with a metal file and repeat Steps A through C. Refer to your Owner/Operator Manual for holder removal and replacement instructions.

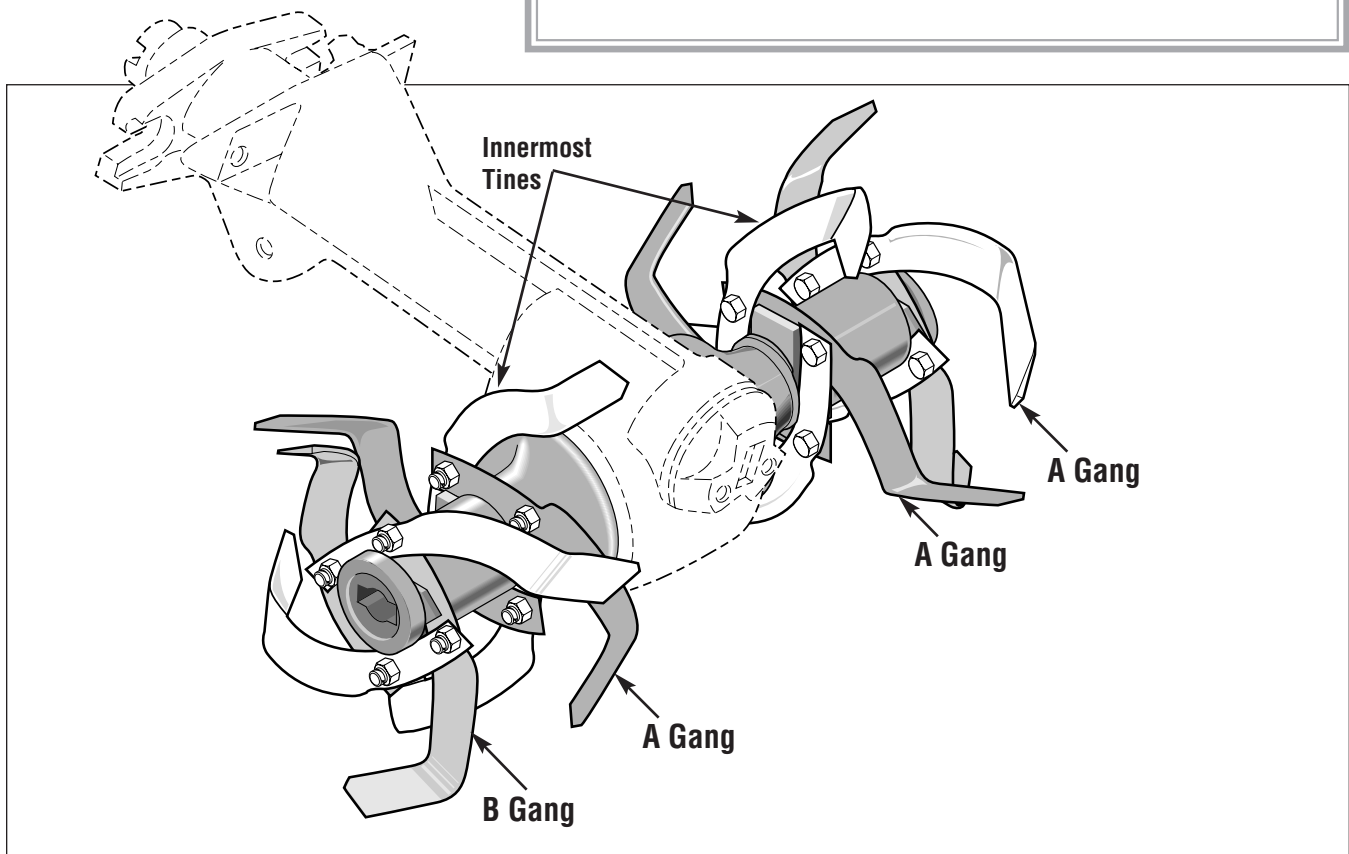


Figure 20: Tines installed on cast iron holders.

Step 5: Check the Installation

This completes the installation of the tines. To ensure that the installation is correct, check for the following:

- Make sure that the tips of the four *innermost* tines (on the left and right sides) are directly *opposite* each other and pointing *toward* each other. See Figure 20.
- Make sure that the *cutting edges* of all tines will enter the soil first when the tiller is moving forward.
- Also read and follow the instructions provided in the Bolo Tines Maintenance Section on Page 16.

PONY MODEL BOLO TINE INSTALLATION

Follow these installation steps if you own a PONY Tiller.

ECONO HORSE owners follow only Steps 1 and 2 below.

Step 1: Install Tines on Left Inner Holder

Tines used in this step:



four *right-curved* tines

A. Begin installing new tines on the left inner holder. See Figure 21.

B. Carefully place two *right-curved* tines (shown shaded in Figure 21) *opposite* each other on the previously installed bolts. Make sure that tines are positioned as follows:

- ✓ Tines are *across from* each other.
- ✓ Tines are against the *outer* surface of the left holder inner plate.
- ✓ The tips point *inward* toward the transmission housing.
- ✓ The *cutting edges* will enter the soil first when the tiller moves forward.

C. Place two more *right-curved* tines (shown partially shaded in Figure 21) *opposite* each other on the bolts, overlapping the tines installed above in Step 1-B. Make sure that the tines are positioned as follows:

- ✓ Tines are *across from* each other.
- ✓ The tips point *inward* toward the transmission housing.
- ✓ The *cutting edges* will enter the soil first when the tiller moves forward.

D. Add lock washers and nuts to all four bolts and tighten securely.

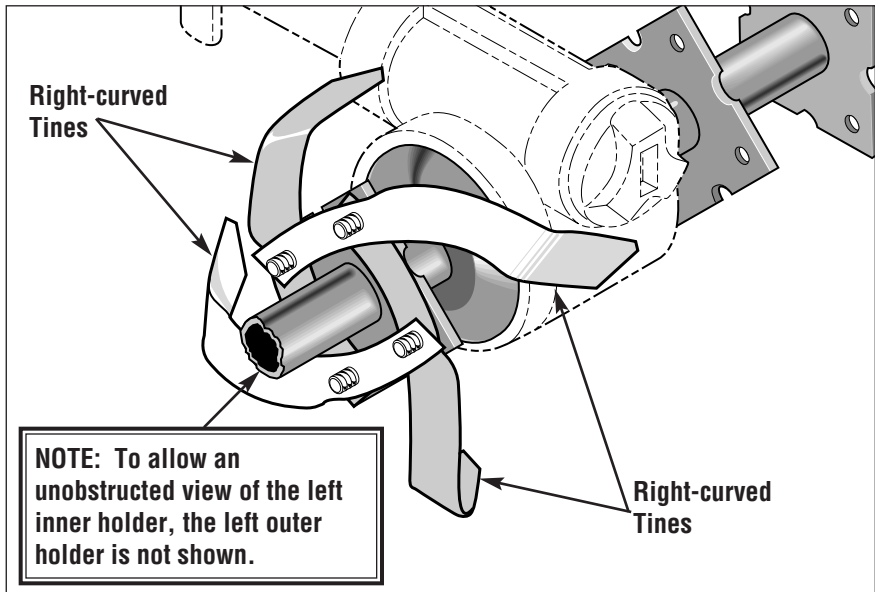


Figure 21: Installing tines on left inner tine holder.

Step 2: Install Tines on Right Inner Holder

Tines used in this step:



four *left-curved* tines

Install the four *left-curved* tines on the *outer* surface of the *right* inner holder (see Figure 22) using the procedure given

in Step 1 for the left inner holder. (The tips of the first two tines installed in this step should be directly *opposite* and *point toward* the tips of the first two tines installed in Step 1-B.) Make sure that the tips of all tines point *inward*, and that all cutting edges face forward.

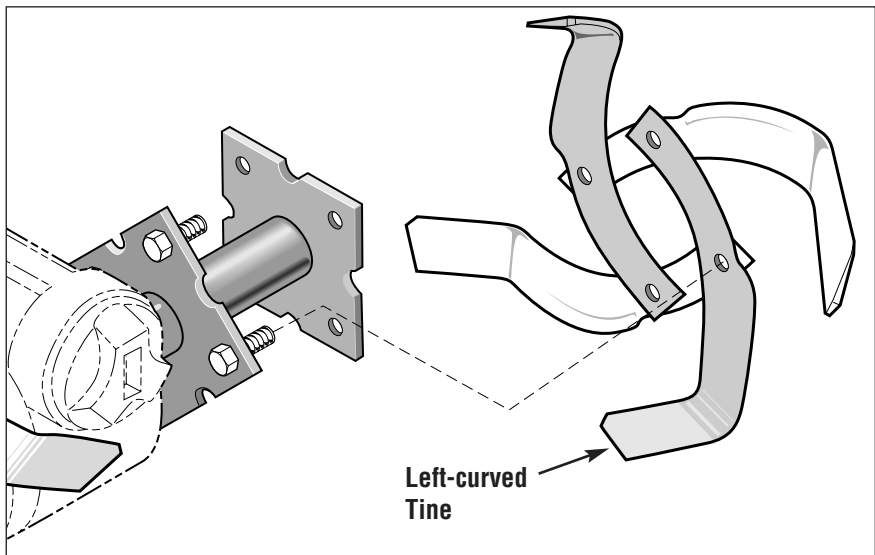


Figure 22: Installing tines on right inner tine holder.

ECONO HORSE owners should now go to the instructions for the Left Outer Holder on Page 14 to complete tine installation.

Step 3. Install Tines on Left Outer Holder

Tines used in this step:



four **right-curved** tines

Follow Steps 1-A through 1-D on Page 12 to install **right-curved** tines on the left outer holder. Make sure that the tines are installed against the **outer** surface of the holder. Make sure that all tips point **inward**, and all cutting edges face forward. See Figure 23.

Step 4: Install Tines on Right Outer Holder

Tines used in this step:



four **left-curved** tines

Follow Step 2 on Page 12 to install **left-curved** tines on the right outer holder. Make sure that the tines are installed against the **outer** surface of the holder. All tips point **inward**. See Figure 23 which shows PONY tines completely installed.

Step 5: Check the Installation

This completes the installation of the tines on your PONY Tiller. To ensure that the installation is correct, check for the following:

- Make sure that the tips of all tines are pointing **inward** (toward the transmission housing).
- Make sure that the **cutting edges** of all tines will enter the soil first when the tiller is moving forward.

Also read and follow the instructions provided in the Bolo Tines Maintenance Section on Page 16.

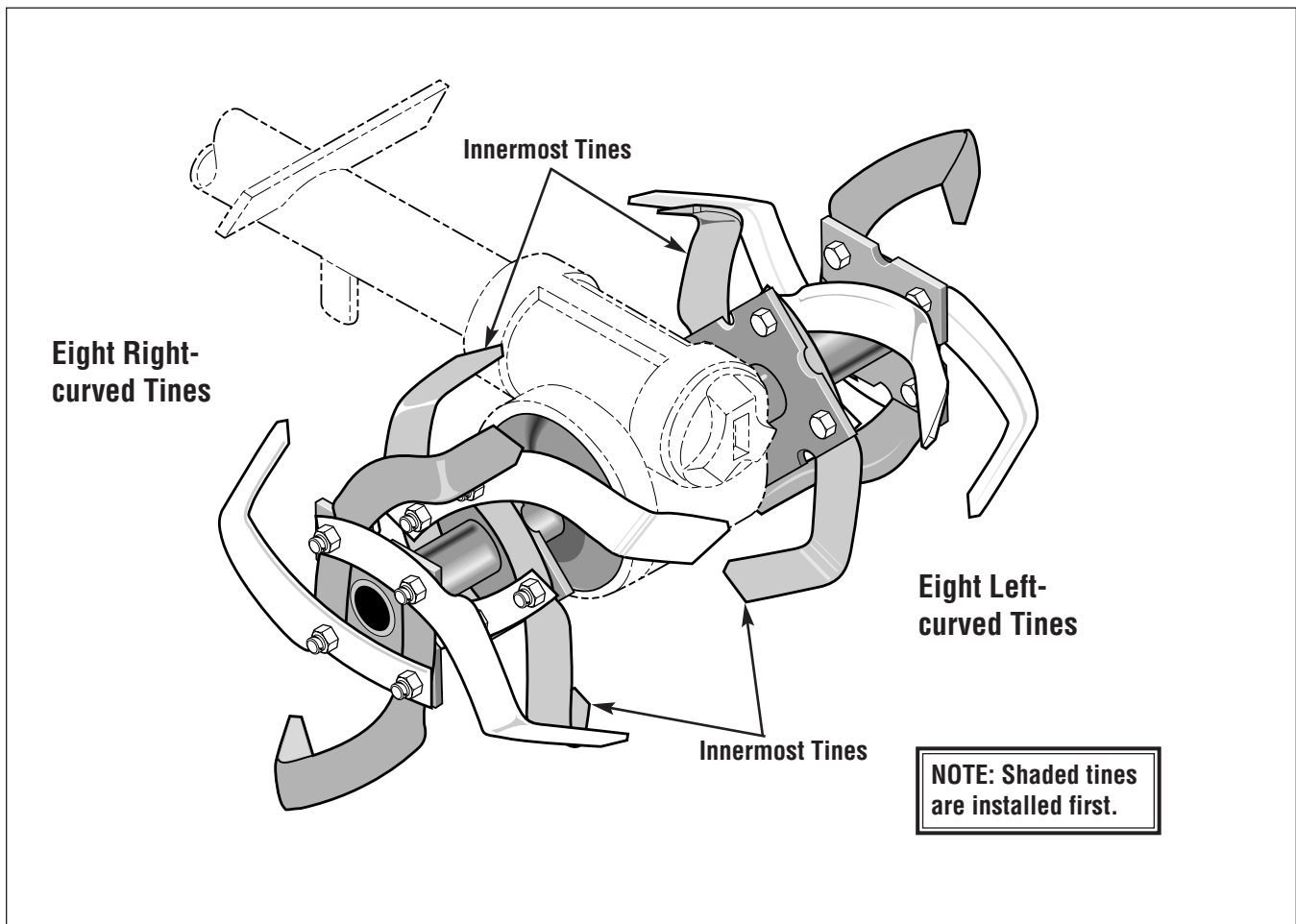


Figure 23: PONY tines installed.

ECONO HORSE MODEL BOLO TINE INSTALLATION

Follow these installation steps only if you own an **ECONO HORSE** Tiller.

NOTE: Tines on *inner holders* are installed the same for both PONY and ECONO HORSE Tillers. However, tines on the outer holders of the ECONO HORSE have a different installation pattern as explained in the following instructions.

ECONO HORSE Tiller owners should first follow Steps 1 and 2 of the instructions given on Page 12 for installing tines on the PONY Model. Then, return to Step 1 below to continue tine installation on your **ECONO HORSE** Model.

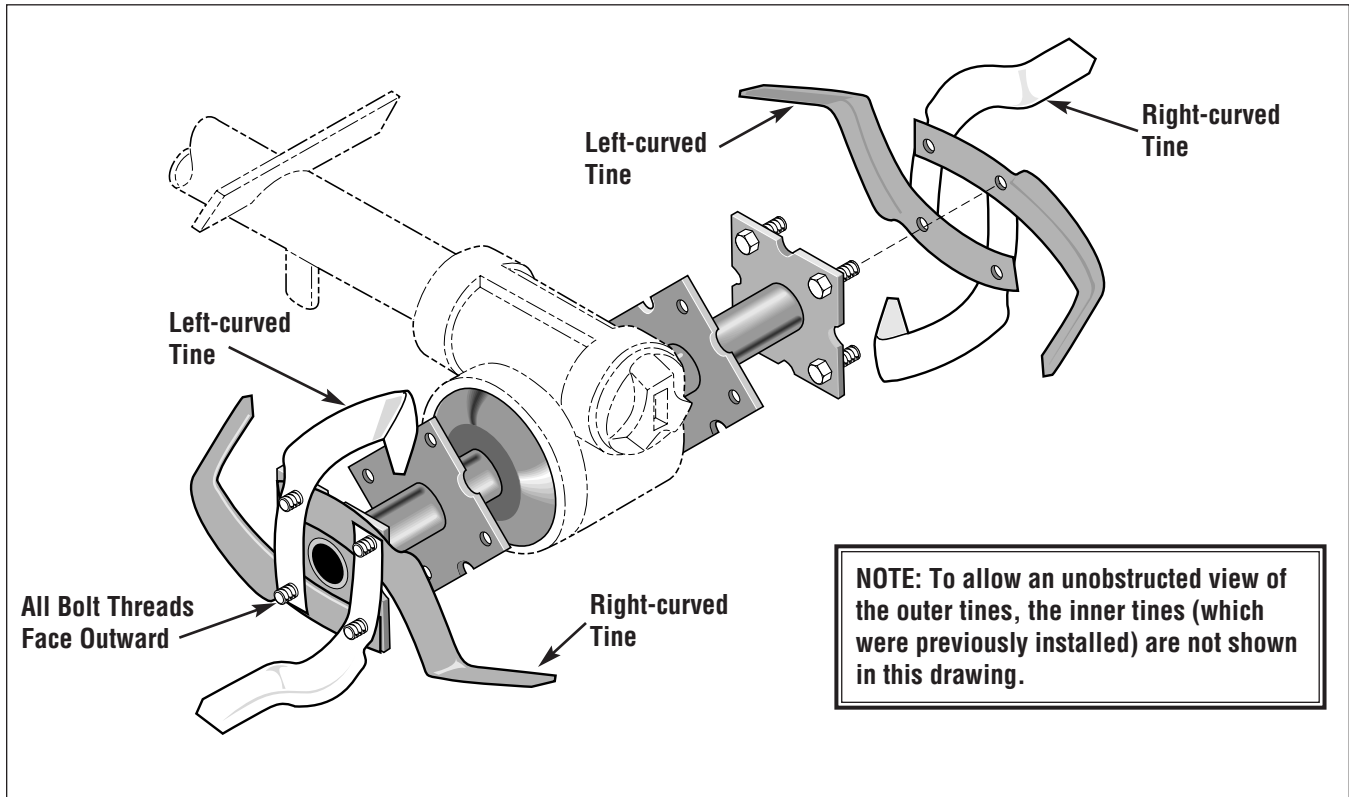


Figure 24: Installing tines on ECONO HORSE outer holders.

Step 1: Install Tines on Left Outer Holder

Tines used in this step:



two **right-curved** tines

followed by



two **left-curved** tines

A. Place two *right-curved* tines (shown shaded in Figure 24) **opposite** each other on the previously installed bolts. Make sure that the tines are positioned as follows:

- ✓ Tines are **across** from each other.
- ✓ Tines are against the **outer** surface of the left holder outer plate.
- ✓ Tips point **inward** toward the transmission housing.
- ✓ The **cutting edges** will enter the soil first when the tiller moves forward.

B. Place two *left-curved* tines (unshaded in Figure 24) **opposite** each other, overlapping the tines positioned in Step 1-A. Make sure that these tines are positioned as follows:

- ✓ Tines are **across from** each other.
- ✓ Tips point **outward** toward the sides of the tiller.
- ✓ The **cutting edges** will enter the soil first when the tiller moves forward.

C. Add lock washers and nuts to all four bolts and tighten securely.

Step 2: Install Tines on Right Outer Holder

Tines used in this step:



two **left-curved** tines

followed by



two **right-curved** tines.

A. Place two **left-curved** tines (shown shaded in Figure 24) **opposite** each other on the bolts which were previously installed. Make sure that the tines are positioned as follows:

- ✓ The tips of these two tines should be directly opposite and point toward the tips of the two tines installed in Step 1-A. See Figure 25.

- ✓ Tines are **across from** each other.

- ✓ Tines are against the **outer** surface of the right holder outer plate.
- ✓ Tips point **inward** toward the transmission housing.
- ✓ The **cutting edges** will enter the soil first when the tiller moves forward.

B. Place two **right-curved** tines (shown unshaded in Figure 24) **opposite** each other, overlapping the tines positioned in Step 2-A. Make sure that the tines are positioned as follows:

- ✓ Tines are **across from** each other.
- ✓ Tips point **outward** toward the sides of the tiller.
- ✓ The **cutting edges** will enter the soil first when the tiller moves forward.

C. Add lock washers and nuts to all four bolts and tighten securely.

Check the Installation

This completes the tine installation of tines on the ECONO HORSE Model. To ensure that the installation is correct, check for the following:

- ❑ Make sure that the tips of the four **innermost** tines on the outer holders are pointing toward each other and inward (toward the transmission housing). See Figure 25.
- ❑ Make sure that the **cutting edges** of all tines will enter the soil first when the tiller is moving forward.

Also read and follow the instructions provided in the Bolo Tines Maintenance Section on Page 16.

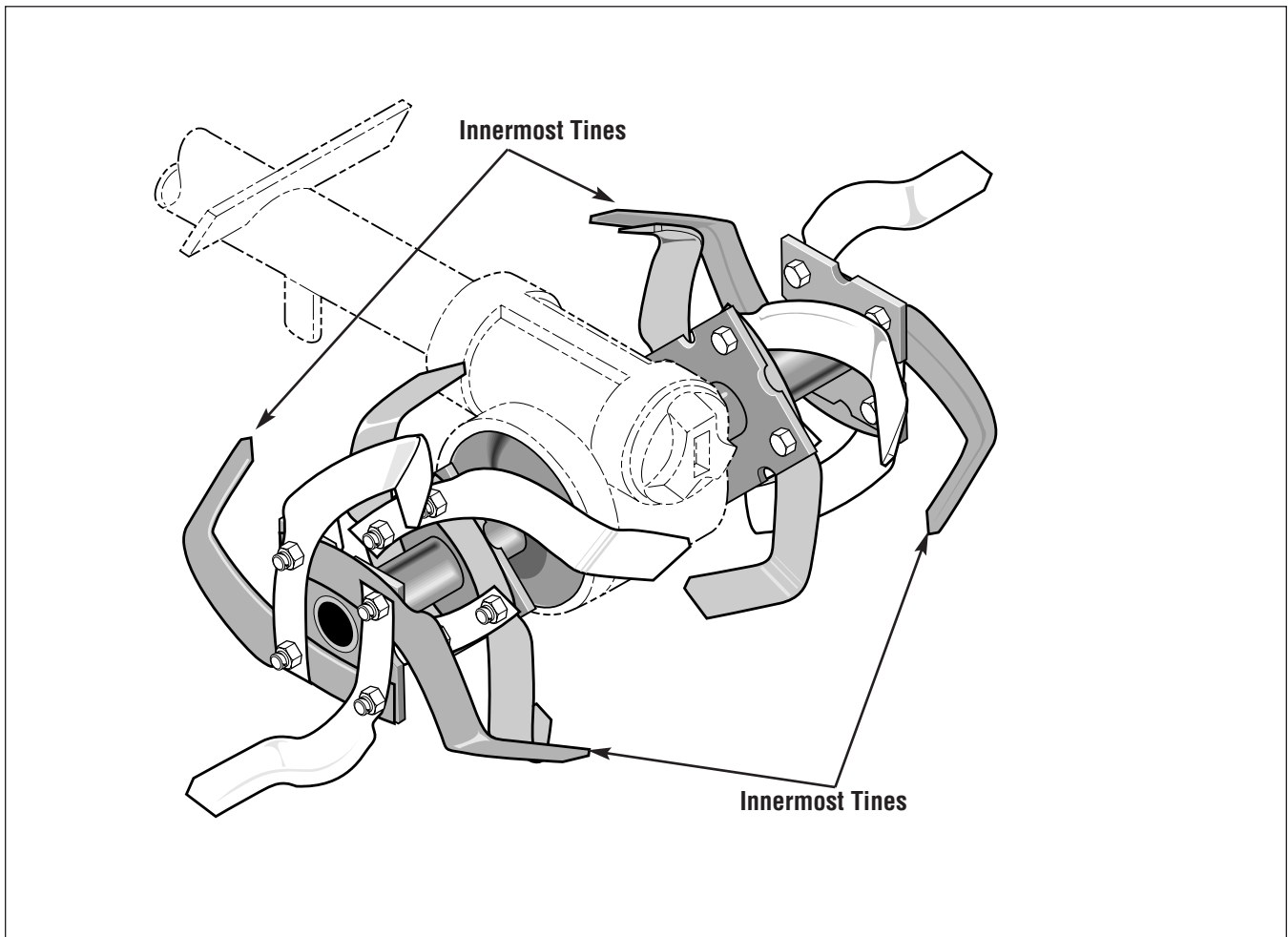


Figure 25: ECONO HORSE tines installed.

BOLO TINES MAINTENANCE

Check Bolts and Nuts

Check all tine attachment bolts and nuts for tightness **every 10 hours** of tiller operation.

Inspect Tines for Wear

Inspect tines after the **first 10 to 15 hours** of tiller operation and then after **every 10 hours**. See Figure 26.

Compare your tines to those shown in Figure 26 to decide whether your tines need replacement. Your tines should be replaced when the following conditions occur:

- Tines are worn beyond the line shown in Figure 26.
- Tines do not dig more than 3 to 5 inches and do not perform well for burying crop residue and for sod busting.
- Tines leave a wide, untilled gap in the middle of a tilled row, so that overlapping becomes very time-consuming.

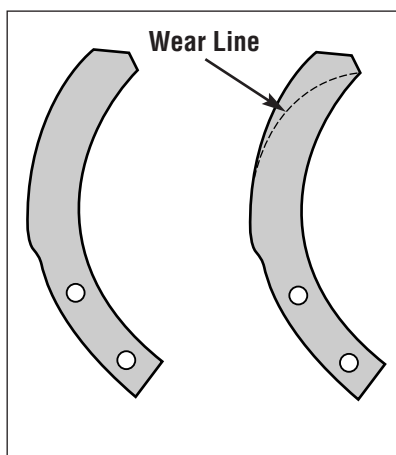


Figure 26: New and worn tines.

Rotate HORSE and ECONO HORSE Tines for Longer Tine Life

HORSE and ECONO HORSE bolo tines can be rotated to obtain a longer life. PONY tines are subject to equal wear because the tine pattern is the same for all tines on a holder. Therefore, rotating tines is not effective for that model.

- Rotate tines once during their life cycle to increase tine life up to 40%.
- Rotate tines to equalize wear among the tines.
- Rotate tines before they wear beyond the line shown in Figure 26.

Horse Model Tine Rotation (Welded Steel Holders)

Tines shown shaded in Figure 27 are in high wear positions. When rotating tines, these tines are moved from high wear to low wear positions.

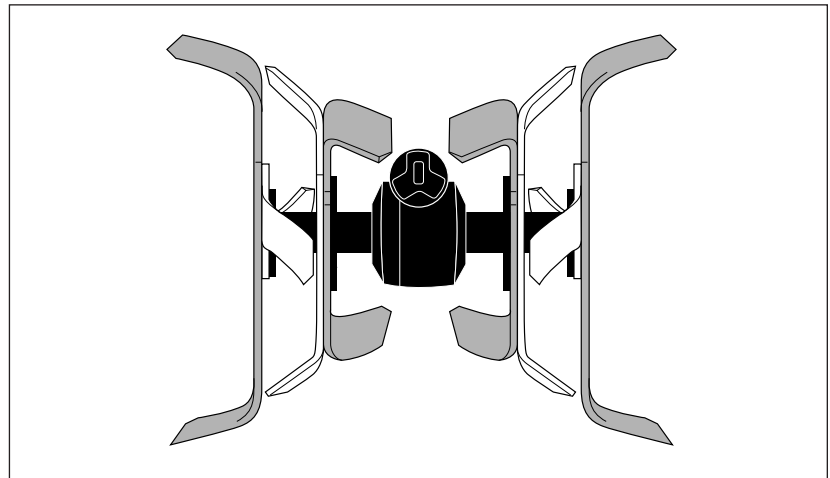


Figure 27: Shaded tines are in high wear positions.

Step 1: Move the two *left-curved* tines (labelled "A" in Figure 28) from the left outer holder to the "B" position on the right outer holder. Move the two *left-curved* tines which were at the "B" position to "A."

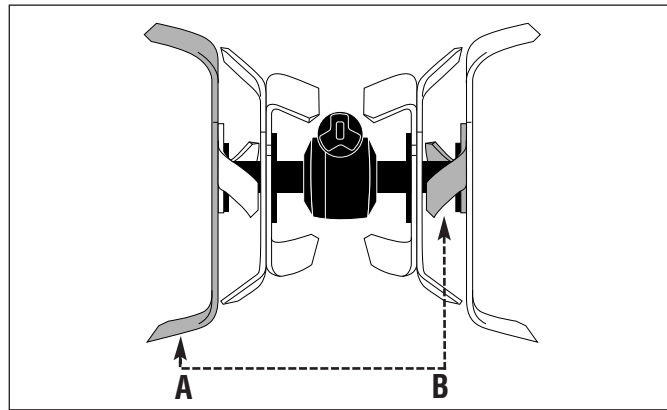


Figure 28: Exchanging position of tines at "A" and "B."

Step 2: Move the two *right-curved tines* from position "C" on the left inner holder to the "D" position on the right inner holder. Move the two right-curved tines which were at the "D" position to "C." See Figure 29.

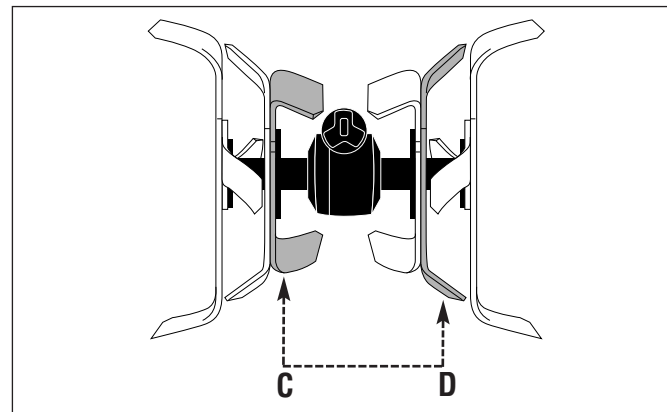


Figure 29: Exchanging position of tines at "C" and "D."

Step 3: Move the two *left-curved* tines from the "E" position on the left inner holder to the "F" position on the right inner holder. Move the two *left-curved* tines which were at the "F" position to "E." See Figure 30.

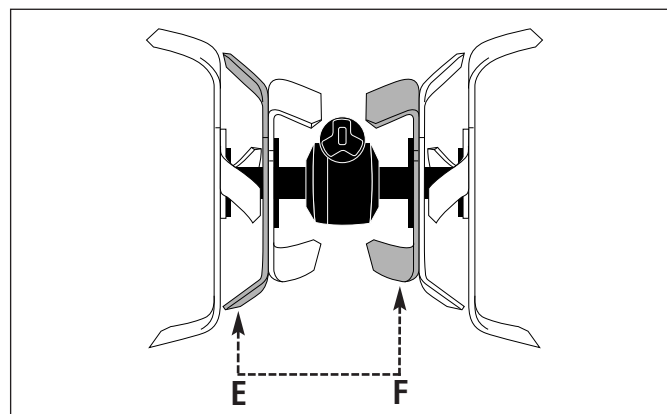


Figure 30: Exchanging position of tines at "E" and "F."

Step 4: Move the two *right-curved* tines from position "G" on the left outer holder to the "H" position on the right outer holder. Move the two *right-curved* tines which were at the "H" position to "G." See Figure 31.

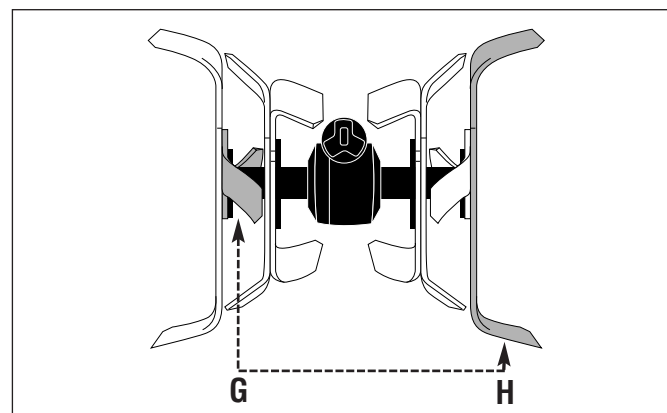


Figure 31: Exchanging position of tines at "G" and "H."

IMPORTANT: Make sure that the cutting edges on all tines will enter the soil first when the tiller is moving forward.

Horse Model Tine Rotation (Cast Iron Holders)

Step 1: Move the entire tine gang labelled "1" in Figure 32 (from the left outer holder) to the "4" position on the right outer holder. Move the entire tine gang labelled "4" in Figure 32 (on the right outer holder) to the "1" position (on the left outer holder).

Note: The shaded tines in Figures 32 are the tines which receive the most wear.

Step 2: Move the entire tine gang labelled "2" in Figure 32 (on the left inner holder) to the "3" position (on the right inner holder). Move the entire tine gang labelled "3" in Figure 32 (on the right inner holder) to the "2" position (on the left inner holder). Now, see Figure 33 which show the positions of the tine gangs after rotation.

IMPORTANT: Make sure that the cutting edges on all tines will enter the soil first when the tiller is moving forward.

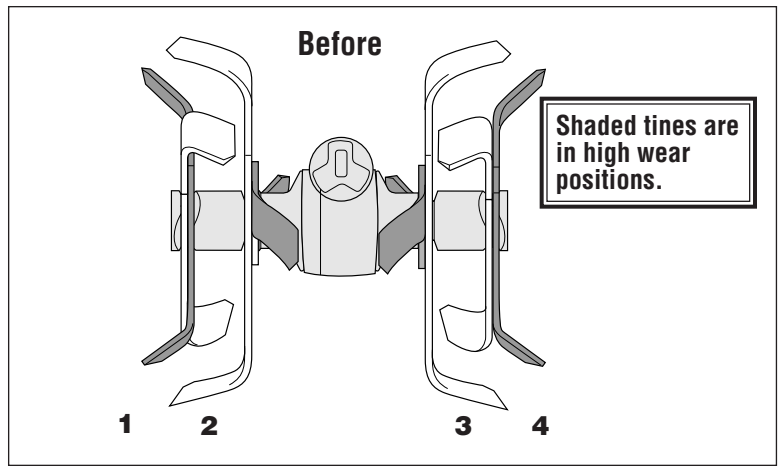


Figure 32: BEFORE rotating gangs on cast iron holders.

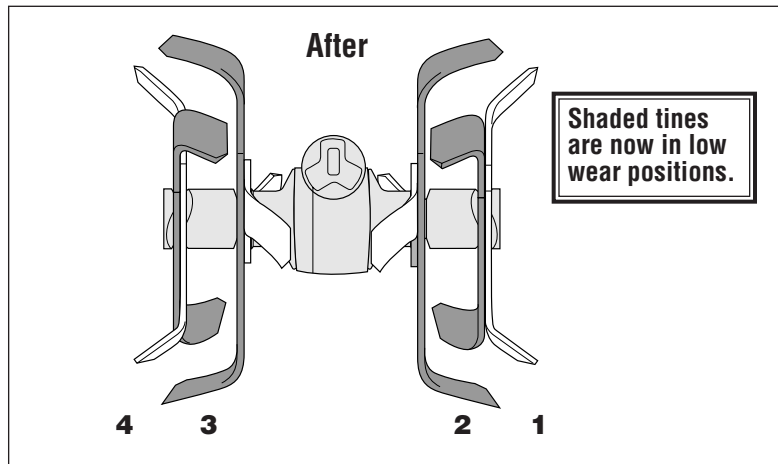


Figure 33: AFTER rotating gangs on cast iron holders.

Econo Horse Model Tine Rotation

Rotate only the four tines on the *outer* holders as indicated below.

Step 1: Move the tines labelled "A" in Figure 34 (on the left outer holder) to the "B" position (on the right outer holder). Move the tines which were at the "B" position to "A."

IMPORTANT: Make sure that the cutting edges on all tines will enter the soil first when the tiller is moving forward.

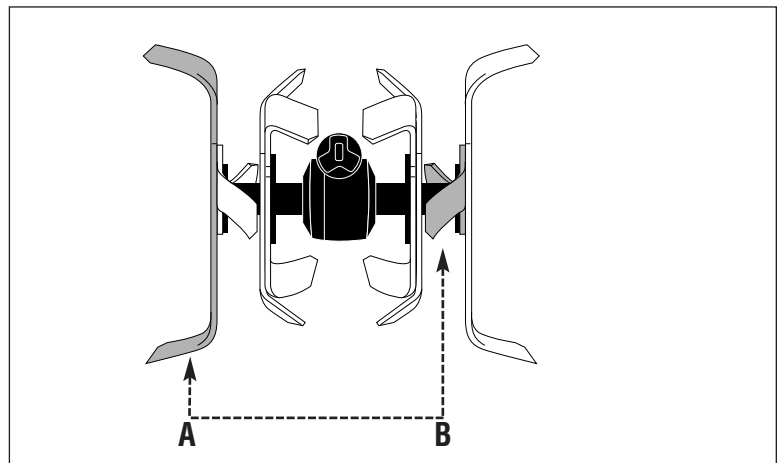
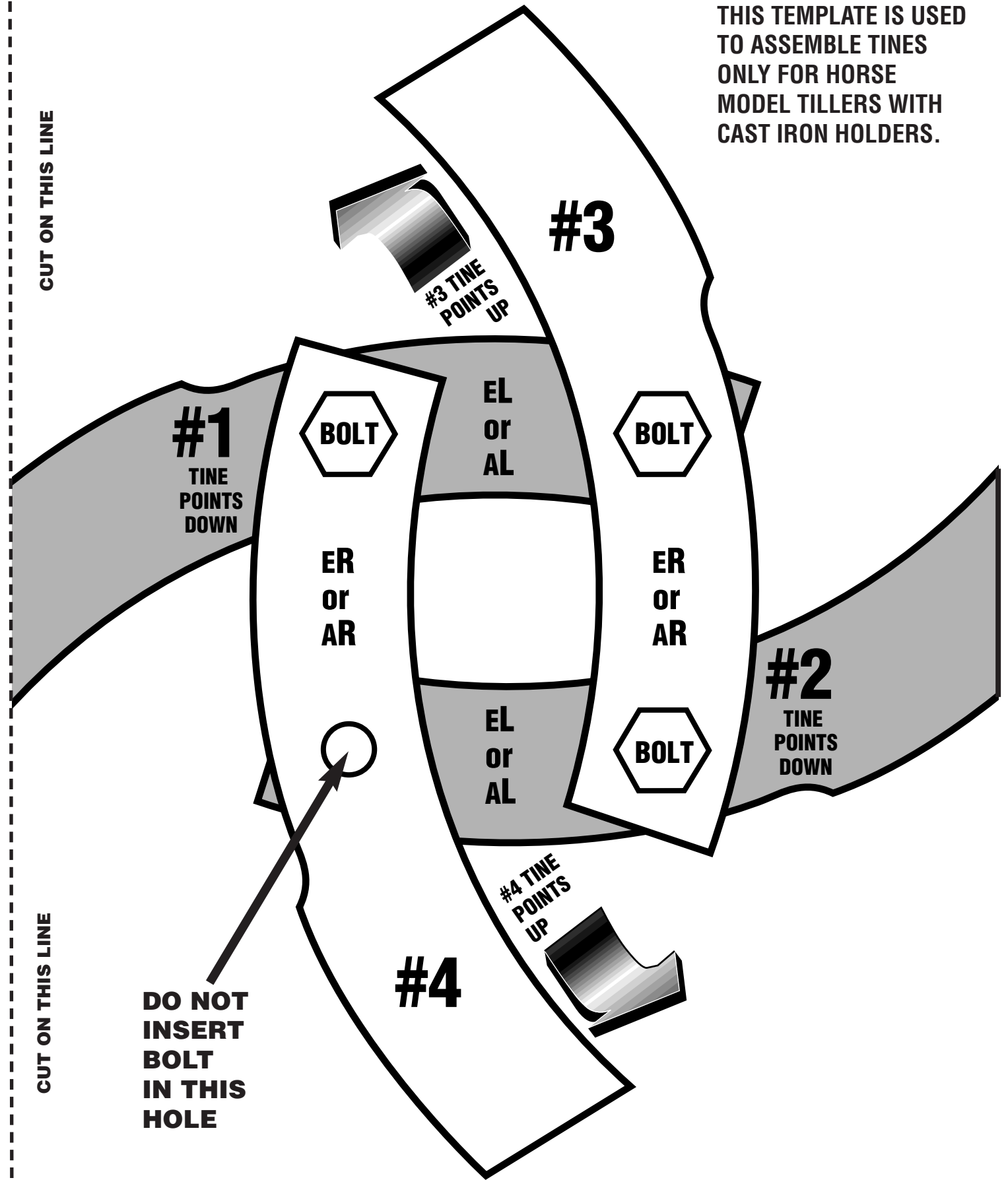


Figure 34: Rotating tines on ECONO HORSE outer holders.

THIS TEMPLATE IS USED
TO ASSEMBLE TINES
ONLY FOR HORSE
MODEL TILLERS WITH
CAST IRON HOLDERS.



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